

## ABSTRACT

In a laser detecting and ranging apparatus in which a light signal is intensity-modulated with a modulating frequency consisting of a frequency in the microwave band for thereby detecting a Doppler frequency relating to the modulating frequency, high reception sensitivity is realized.

The apparatus comprises a light transmitting unit for transmitting a light signal from a light source 1 as a transmitted beam L1 into the atmosphere, a light receiving means for receiving a light beam L2 from the atmosphere as a received light, an oscillator 10 for outputting a modulating signal having at least one modulating frequency as a carrier frequency, and a signal processing unit 12 for detecting properties of the atmosphere on the basis of the received light, wherein the light transmitting unit includes a light intensity modulator 2 for performing intensity modulation on the light signal from the light source 1 with the modulating signal, and wherein the signal receiving means includes an optical frequency conversion means 9 for converting the frequency of the intensity-modulated component of the received light to a base-band frequency, and an optical detection means 11 for directly detecting an output signal from the optical frequency conversion means 9 to thereby convert into an electric signal to be subsequently inputted to the signal processing unit 12.